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A Guide for Measuring Sorghum Harvest Losses

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FS 507

A Guide For Measuring Sorghum Harvest Losses

COOPERATIVE EXTENSION SERVICE:
SOUTH DAKOTA STATE UNIVERSITY AND
U. S. DEPARTMENT OF AGRICULTURE

A Guide for Measuring Sorghum Harvest Losses

By G. R. Durland, extension agricultural engineer

A sure way to up harvested sorghum yield is to use a fast, easy method for measuring machine losses. Once the source and extent of loss is known, it is easy to make changes in machine adjustment and operating practices to keep losses at a minimum. Losses can be measured in ten minutes or less.

1. An average of 17 kernels per square foot equals about one bushel per acre loss.
2. Construct a rectangular frame that encloses an area of ten square feet and is equal in width to the combine header. See Table 1. A plastic clothesline taped to four wire pins made of No. 9 wire makes a handy measuring frame.
3. Place the rectangular frame across the machine swath as shown in sketch below and make loss counts for: total crop loss, pre-harvest loss, and machine loss.

Table 1. Dimensions for Rectangular Frame

Header width (ft.) (Frame length)	Frame width (in.)	Header width (ft.) (Frame length)	Frame width (in.)
8'	15"	16'	7.5"
10'	12"	17'	7"
12'	10"	18'	6.7"
13'	9.25"	20'	6"
14'	8.6"	22'	5.5"
15'	8"	24'	5"

Suggestions for Better Efficiency

1. Be sure combine is in good operating condition.
2. Operate cutterbar just low enough to catch lowest heads.
3. A modified reel with 6-16 inch batts will have less field loss than conventional 4-14 inch batts.
4. Cylinder speed of 780 to 800 rpm will result in less seed damage. Increasing cylinder speed to usual recommendations of 1000 to 1300 rpm will increase kernel cracking by about 10 to 25 percent.
5. Cylinder concave clearances of 3/8 inch in front and 5/16 inch, or less, in rear give best results.
6. A ground speed of 2 to 2.5 miles per hour works best. To determine ground speed, count the number of 3 feet steps taken in 20 seconds while walking beside the combine. Divide this number by 10 to get the ground speed in miles per hour.
7. Moisture content of seed should be 13 or 14 percent when sorghum is combined. If it is to be artificially dried, it may be combined sooner.
8. Using guard extensions with rods that extend ahead and above the guards or row-crop gathering units will cut losses considerably, as much as 25 percent in lodged sorghum.
9. Install some type of straw walker cover to minimize choke-up of straw walkers.

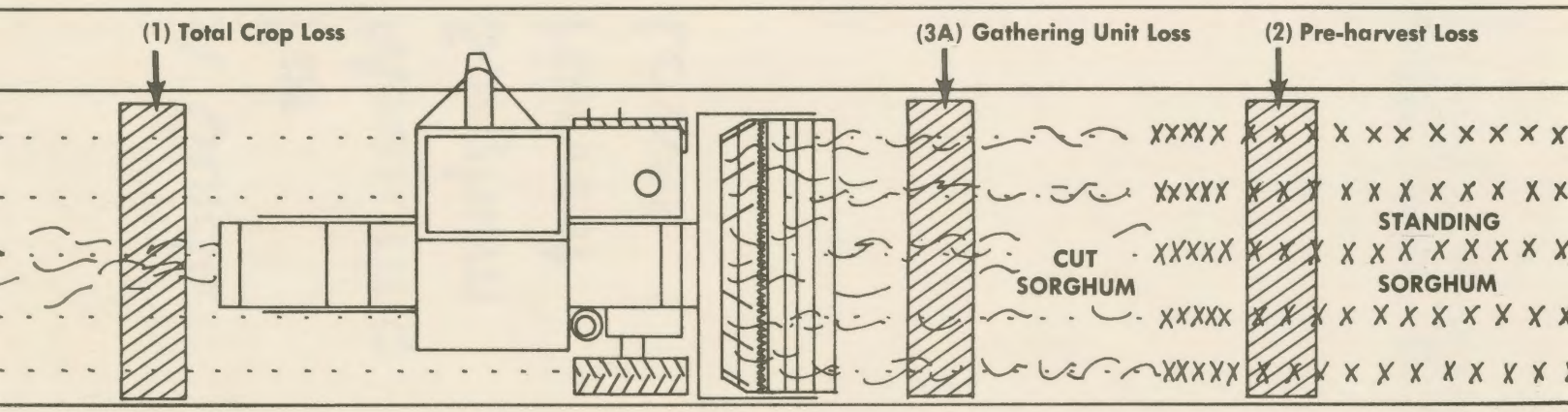

Table 2. Sorghum Loss Data

Source of Loss	Column A Kernels Counted in 10 sq. ft. area	No. Kernels 1 Bu./Acre	Column B Subtract Pre-Harvest Loss	Column C Sorghum Loss Bu./Acre	Desirable Loss Level % of Yield (Expected Loss based on 35 bu./acre yield
1. Total Crop Loss		170			
2. Pre-Harvest Loss		170			
3. Total Machine Loss					10% (3.5 bu./A)
4. Gathering Unit Loss		170			8% (2.8 bu./A)
5. Separation Loss					2% (.7 bu./A)

Procedure

1. **Total Loss.** Stop combine at least 300 feet from ends of field and where crop is representative of the entire field. Back up combine about 15 feet. Place rectangular frame across swath harvested at rear of combine. Count all kernels in the frame and enter this count in Table 2., Loss Data, Column 1-A. Divide this number by 170, and enter the loss in bushels per acre in Column 1-C. If loss is 10 percent or more of yield, then check operation to pinpoint loss.
2. **Pre-harvest Loss.** Determine pre-harvest loss by placing rectangular frame in unharvested sorghum. Count loose kernels on ground and kernels in heads laying loose on ground. Enter this number in Column 2-A, divide by 170 to get loss in bushels per acre, and enter this figure in Column 2-C.
3. **Machine Loss.** Machine loss is determined by subtracting pre-harvest loss, Column 2-C, from the total loss. If machine loss is less than 10 percent keep right on harvesting. If more, proceed to check gathtering unit losses.
   a. **Gathering Unit Losses.** Gathering unit losses are determined by placing the rectangular frame in the space between the parked combine and the standing sorghum. Count all sorghum kernels that are found in this area. This includes all kernels on ground, kernels still in heads on ground or attached to stalk. Enter this total in Column 4-A. To determine gathering unit loss, divide the total number of kernels counted by 170, then substract pre-harvest losses as determined in Column 2-B. Enter result in Column 4-C.
   b. **Separation Loss.** Cylinder and separation loss is determined by subtracting gathering unit loss from machine loss. Enter this in Column 5-C.
4. Total loss = pre-harvest loss + machine loss.
5. Machine loss = gathering unit loss + separation loss.
6. Compare the loss levels in Column C with those in Column D. This will give an indication of where excessive losses are occurring and will allow you to concentrate on correcting these trouble areas.

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